

This document was prepared in conjunction with work accomplished under Contract No. DE-AC09-96SR18500 with the U. S. Department of Energy.

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MC&A Center of Excellence Through Benchmarking and INMM Involvement - Key Tools for Change

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ABSTRACT

Nuclear Materials Management Department, a BWXT-corporate partner with Westinghouse Savannah River Company, has established a vision for positioning the organization as a Global Center of Excellence for Strategic Materials Management. NMM's *Road to Excellence* results from a changing business environment where flexibility and adaptability have become key demands from the Department of Energy customer. Flexibility and adaptability are integral components of the department's *MC&A Center of Excellence* philosophy in the pursuit of improvement technologies that meet domestic and international safeguards requirements. The customer challenge has put the organization in the forefront of change where benchmarking with other MC&A programs, applying human performance technologies and leveraging INMM leadership and participation opportunities are key ingredients to influencing improvements and changes in existing MC&A standards, policies and practices.

The paper challenges MC&A professionals, MC&A program owners and organizational leaders to engage in the debate of new ideas, partnering arrangements and timely deployment of technologies (human performance and technical-based applications) to exponentially improve safeguards programs. Research and development efforts in support of safeguards improvements need to seriously consider deployment to field practitioners within a 2-3 year time frame from inception. INMM plays a crucial role in accelerating such opportunities and establishing improved performance standards above our normal governmental and organizational bureaucracies.

INTRODUCTION – DULL OPTICS OF SAFEGUARDS

Safeguards...the “red-headed step-child of the *safeguards* and security world”...the more illusive of the two worlds, more complicated, least understood but most aligned with our operational handling of special nuclear material. Certainly the “optics” of the physical security world is more obvious to the masses in our industry because of our normal contact in just getting to our work stations. Barricades, gates, guns, guards, badges are all the obvious “outsider” senses one experiences as a “Q-cleared” employee in our daily trek to work...subtle, but subconscious reinforcement, of a very critical element of our overall safeguards and security system. Very few people argue with the guy with the gun, besides, we all probably can describe in vivid detail what an “outsider” would look like and do. Fast-forward to *safeguards*. That part of our “insider” system is less seen by the masses, certainly less glamorous and less onerous than a fully-equipped security inspector, more technical in dimension with laboratory technicians, chemists, CTFs, PhD's and statisticians working material sampling and NDA instrumentation measurement uncertainty and measurement control issues, along with MBA custodians and clerks navigating their way through the latest version of LANMAS with a two-day turn-around entry requirement between shipment and receipt that's almost late. Compound it with HRP, separation of duty requirements for custodians, two-person rule application for all MAA entries, daily administrative checks and a routine periodic

MC&A Center of Excellence Through Benchmarking and INMM Involvement - Key Tools for Change

physical inventory of material that runs the risk of delaying operations, to name a few, and safeguards is a place you *don't* want to be...or so it would seem. Why *safeguards* is important is because of us...the "*insider*" ...the employee that is not so obvious, but is so knowledgeable of the rules and material processes that, if left unchecked, creates a consequence no employee or member of the public would tolerate. *The failure of the insider mitigation strategies to prevent the theft or diversion of special nuclear material is plainly, without exception, not acceptable.* Consequences would be so disastrous in loss of public confidence, much less malevolent, catastrophic use of the actual material that no company could survive in the market with such a safeguards record. As safeguards professionals, we have an obligation to maintain a balanced set of defense-in-depth strategies to mitigate this consequence...we represent that defense element within our respective corporate interests and have an obligation to keep that responsibility in the forefront of our corporate leadership. With competing interests (internally and externally) and the strains on our local, state and national budgets across the spectrum today, the demand for *integrated safeguards and security and application of automated and human performance-based technologies* is vitally important in the successful execution of our safeguards roles and responsibilities and equally so to the public we serve.

NMM GLOBAL CENTER OF EXCELLENCE

At Savannah River Site, Nuclear Materials Management has established a vision for Global Excellence in Strategic Management of Nuclear Materials. Supportive of this vision is the expectation to create Centers of Excellence in Safeguards and Security. The focus of this paper will be on the *Safeguards* component...a component of our business that has been in the forefront of automated material surveillance within the DOE complex for several years because of a dedicated, forward-thinking DOE customer who has fostered automated technologies and supported the organization in working through technical security requirements. This technology has been very successful. Because of our material surveillance capabilities, the physical inventories are now conducted annually versus bimonthly, a significant productivity and savings for operations. NMM just recently completed automated material surveillance connectivity from SRS to Vienna, Austria, with our IAEA customer. NMM has fostered a mutually rewarding relationship with our international agency counterparts through our joint efforts with the local DOE customer and the DOE HQ NNSA customer. Being part of the larger international effort in supporting nonproliferation initiatives has proven worthwhile in our ability to leverage a proven automated material surveillance methodology. The challenge for us now is to move this previous R&D effort into a more formal configuration management profile with appropriate system descriptions and related performance baselines that can be used as standards for ensuring compliance. The surveillance system has also laid the ground work upon which to build a more robust, flexible capacity to meet the strategic material storage and processing needs of the nation's nuclear material. The facility now serves as a showcase for national and international visitors typically accompanied by our senior DOE management team.

NMM's performance has always represented a safe and disciplined approach to its corporate responsibilities for strategic material management in all facets of the business.

MC&A Center of Excellence Through Benchmarking and INMM Involvement - Key Tools for Change

It has also excelled in satisfying the DOE customer because of its organizational flexibility to anticipate and meet changing customer needs in tough, dynamic business climates. The organization has been able to take flexibility and turn it into capacity to meet the DOE, IAEA and NNSA needs in storage, surveillance and safeguards integration. Projects that are underway call for increased safeguards integration, additional new processes for stabilization and packaging and upgraded facility infrastructure to support long-term enduring missions as materials and forms change with quantity and types.

SAFEGUARDS CHALLENGES

The *Road to Excellence* is not without its challenges as an MC&A Center of Excellence. Meeting domestic and international safeguards expectations requires first-rate communications and negotiating skills between all vested parties, most importantly and in many cases, between the DOE program office and the DOE safeguards office. While the mission may be common to the parties, the interests, at times, competes with other interests of significance (operational schedules, project schedules, safeguards measures, financial and/or human resource limitations etc.). The DOE-SR safeguards customer has been extremely valuable reinforcing our application of technology and has been a proponent of such approaches during national INMM forums. By paving the way, some DOE Order hurdles, mostly in technical security, have been overcome; however, there is still much to do when technology is applied to the requirements of DOE Manual 470.4-6 (replacement for 474.1-1B), Manual for NMC&A. Many safeguards standards are predicated on manually applied DOE Manual requirements, e.g., Two-person rule, daily administrative checks, etc. When applied with automated material surveillance systems, some of these checks and balances no longer contribute, but in fact, become non-productive. Automated surveillance with its many benefits has placed NMM in the forefront of pioneering new rules and challenging antiquated paradigms, but this is expected to be an uphill climb. Pursuing a more strategic approach as noted below in influencing new standards for automation makes sense.

STRATEGIC OPPORTUNITIES

Strategic opportunities exist to influence the industry and our government leadership in adapting to an automated safeguards environment. NMM Safeguards partnering arrangements within the Southeast region of the United States with Y-12 MC&A, as an example, provides the stimulus to engage the regional interests and subsequently, the national interests through the INMM. NMM is taking an active recruitment role in increasing INMM memberships in the local chapter and also identifying volunteers to support related ANSI Technical Committees and Subcommittees relevant to improving standards that need to accommodate automated, paperless systems.

Another major initiative underway by NMM Safeguards is integration of human performance technologies throughout its organization. One might ask, "Why human performance integration with safeguards and security hardware and automated technologies"? Although a facility may have an elaborate system of safeguards and security hardware, lapses in security have persisted and will continue to exist. "Hardware by itself does not produce security; people do," says General Eugene E. Habiger,

MC&A Center of Excellence Through Benchmarking and INMM Involvement - Key Tools for Change

Distinguished Fellow and Policy Adviser with the University of Georgia Center for International Trade and Security, where he assists with the Center's international programs aimed at preventing weapons proliferation and reducing nuclear dangers. He also served as the former Department of Energy's "Security Czar," where he was charged by the Secretary with changing the security culture at DOE and establishing a program to re-energize and restore confidence in the Department's Security Program. Harbiger's *Preface to Nuclear Security Culture: The Case of Russia*,¹ is a brilliant opening on the concept of the human factor in protecting Russian nuclear sites. While the report focuses on Russia, the application is equally important to any country or organization responsible for sustaining and improving a security culture. Excellent companies who always perform excellent understand the need for such human performance integration and the subsequent achievement in sustaining a corporate culture that not only reflects technical proficiency of the people entrusted with safeguards and security, but also their willingness and motivation to follow established procedures, comply with regulations and take initiative when the unexpected, unplanned safeguards and security events and circumstances occur. INPO and many commercial utilities have been down this road for at least a decade...its time for human performance technologies to become an equal partner in our NMM safeguards and security program, as well as its influence throughout the larger NMM organization and the broader DOE/INMM nuclear community.

MODEL FOR SUCCESS

NMM Safeguards plans to set expectations of safeguards excellence and commit necessary resources to define organizational and programmatic interfaces and communicate those expectations through performance-based standards. Such standards will be reinforced through work place practices and resultant employee behaviors that can be observed and measured. It's not expected to be an easy assignment; but the journey will be one that's been followed by many successful organizations, particularly in INPO, and the author of this paper in a previous assignment.^{2,3} There is ample opportunity to partner in pursuing this new concept of modeling a nuclear safeguards and security culture. It's time to network, build bridges of communications, bring new ideas to the INMM table and move from our Cold War, stand alone mentality, to agile safeguards organizations of the 21st century. Not only is the challenge for the NMM organization to drive in a new, improved culture direction⁴, but it's also a test of resolve for the nuclear community and INMM leadership to move aggressively in this soft field enterprise in addition to pursuing automated technologies. IAEA and other international cultures recognize the need. Successful organizations *prevent, detect and correct problems* involving *management, processes and work practices* before they become tragic. Problematic organizations do not.

REFERENCES

1. Igor Khripunov, Dmitriy Nikonov, Maria Katsva, James Holmes, *Nuclear Security Culture: The Case of Russia*, Center for International Trade and Security, University of Georgia, Athens, GA, Dec. 2004.
2. Cathy Corbett, Bruce Emmons, Dan Lyons, *WSRC Training Performance Improvement Self-Evaluation (TPIS) and Training Value Equation (TVE)*, Contract AC19368N, Performance Improvement International (PII), Sept. 17, 2001.
3. Cathy Corbett, *Advanced Root Cause Analysis Technology Training*, PII, Oct. 2002.
4. James Reason, *Managing the Risks of Organizational Accidents*, Ashgate Publishing Ltd., 1997.